

Claims

1. A method for determining a phase of an internal combustion engine with an intake zone (1), an outlet zone (4),

5 at least one camshaft (18, 18'), which acts on gas exchange valves and whose phase in respect of a crankshaft (8) can be adjusted by means of a phase adjusting device (20), and with at least one sensor, as a function of whose measurement signal a determined phase (PH_E) is determined, with which

10 - the phase adjusting device (20) is activated to adjust the phase of the camshaft (18, 18') until a reflux of gas from the outlet zone (4) into the intake zone (1) is identified, and
- a correction value (KOR_E) is determined as a function of the determined phase (PH_E) then assigned and a predetermined

15 default phase (PH_G) and

- the respectively determined phase (PH_E) is then corrected as a function of the correction value (KOR_E) during subsequent operation.

20 2. The method as claimed in claim 1, in which the reflux of gas from the outlet zone (4) into the intake zone (1) is identified as a function of an intake pipe pressure (P_IM).

25 3. The method as claimed in claim 2, in which the reflux of gas from the outlet zone (4) into the intake zone (1) is identified, when the intake pipe pressure (P_IM) exceeds a predeterminable intake pipe pressure threshold value (THD(P_IM)) under predetermined operating conditions.

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4. The method as claimed in one of claims 2 or 3, in which the reflux of gas from the outlet zone (4) into the intake zone (1) is identified, when an amplitude of a position of the

intake pipe pressure (P_{IM}) exceeds a predeterminable pulsation threshold value (THD_{PULS}).

5. The method as claimed in one of the preceding claims, in
which

the reflux of gas from the outlet zone (4) into the intake zone (1) is identified as a function of a temperature (T_{IM}) of the gas in the intake zone (1).

10 6. The method as claimed in claim 5, in which
the reflux of gas from the outlet zone (4) into the intake zone (1) is identified, when the temperature (T_{IM}) of the gas in the intake zone (1) exceeds a predeterminable temperature threshold value ($THD_{T_{IM}}$).

15 7. The method as claimed in one of the preceding claims, in which

the reflux of gas from the outlet zone (4) into the intake zone (1) is identified as a function of a temperature of the gas in the outlet zone (1), when the detected temperature changes from a value, which is representative of the absence of exhaust gases, to a value, which is representative of the presence of exhaust gases, during an operating state of the internal combustion engine, without fuel being fed in.

25 8. The method as claimed in claim 7, in which
the reflux of gas from the outlet zone (4) into the intake zone (1) is identified, when the temperature of the gas in the outlet zone (1) exceeds a predeterminable further temperature threshold value.

30 9. The method as claimed in one of the preceding claims, in which

the internal combustion engine is assigned a gas type sensor (42) in the exhaust gas zone (4), whose measurement signal is representative of the presence or absence of exhaust gases in the region of the gas type sensor (42),

5 - with which the reflux of gas from the outlet zone (4) into the intake zone (1) is identified, when the measurement signal of the gas type sensor (42) changes from a measurement signal value, which is representative of the absence of exhaust gases, to a measurement signal value, which is representative
10 of the presence of exhaust gases, during an operating state of the internal combustion engine, without fuel being fed in.

10. A device for determining a phase of an internal combustion engine with an intake zone (1), an outlet zone (4),

15 at least one camshaft (18, 18'), which acts on gas exchange valves and whose phase in respect of a crankshaft (8) can be adjusted by means of a phase adjusting device (20), and with at least one sensor, as a function of whose measurement signal a determined phase (PH_E) is determined, with the device being
20 configured

- to activate the phase adjusting device (20) to adjust the phase of the camshaft (18, 18') until a reflux of gas from the outlet zone (4) into the intake zone (1) is identified, and

- to determine a correction value (KOR_E) as a function of the
25 determined phase (PH_E) then assigned and a predetermined default phase (PH_G) and

- to correct the respectively determined phase (PH_E) as a function of the correction value (KOR_E) during subsequent operation.